

Name _____
Date _____

Teacher _____
Section _____

Geometry Unit 08: Congruent Triangles 2009 - 2010

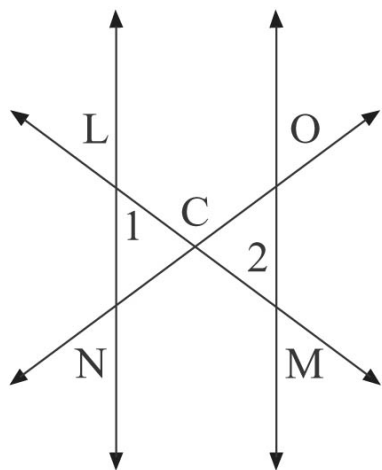
Instructions: Select the best answer for each multiple choice item.

For the questions that are not multiple choice, show your work and/or justification for your answer.



1.

Which of the following shows the steps of the proof that $\triangle NCL \cong \triangle OCM$ are in the correct logical order if given that C is the midpoint of \overline{NO} and that lines \overline{LN} and \overline{OM} are parallel?



A.

$$\overline{NC} \cong \overline{CO}$$

$$\angle 1 \cong \angle 2$$

$$\angle LCN \cong \angle MCO$$

C is the midpoint of \overline{NO}

$$\triangle NCL \cong \triangle OCM$$

B.

$$\overline{NC} \cong \overline{CO}$$

$$\angle LCN \cong \angle MCO$$

$$\angle 1 \cong \angle 2$$

C is the midpoint of \overline{NO}

$$\triangle NCL \cong \triangle OCM$$

C.

C is the midpoint of \overline{NO}

$$\overline{NC} \cong \overline{CO}$$

$$\angle LCN \cong \angle MCO$$

$$\angle 1 \cong \angle 2$$

$$\triangle NCL \cong \triangle OCM$$

D.

$$\angle LCN \cong \angle MCO$$

$$\overline{NC} \cong \overline{CO}$$

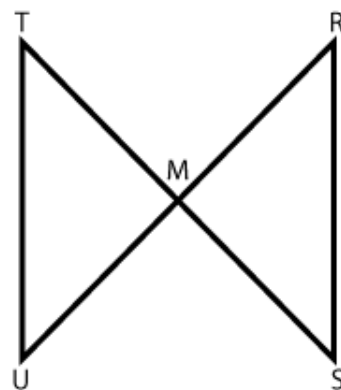
C is the midpoint of \overline{NO}

$$\angle 1 \cong \angle 2$$

$$\triangle NCL \cong \triangle OCM$$

2.

If you know that point M is the midpoint of \overline{TS} and \overline{UR} , which of the triangle congruence methods could be used to prove $\triangle TUM$ and $\triangle RSM$ are congruent?



A.

SAS

B.

ASA

C.

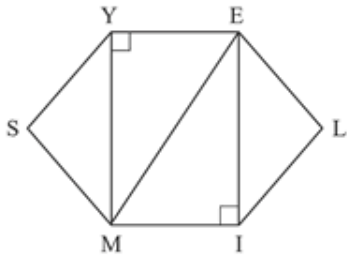
SSS

D.

AAA

3.

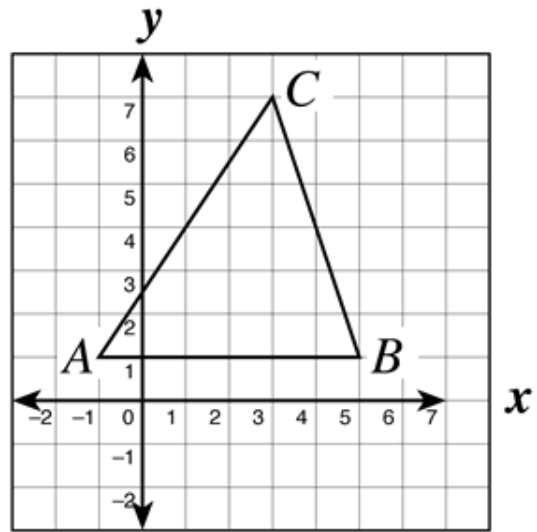
SMILEY is a regular hexagon. Which pair of triangles formed within SMILEY can be proven congruent using SSS congruence?



- A. $\triangle MSY \cong \triangle ELI$
- B. $\triangle EYM \cong \triangle EIM$
- C. $\triangle MSY \cong \triangle EIM$
- D. $\triangle ELI \cong \triangle EYM$

4.

When placed on a coordinate plane, Points $A(-1, 1)$, $B(5, 1)$, and $C(3, 7)$ define Triangle ABC .

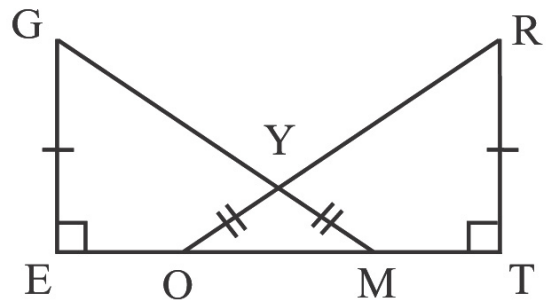


If \overline{CD} is an altitude of Triangle ABC , what are the coordinates of D ?

- A. (1, 2)
- B. (1, 3)
- C. (2, 1)
- D. (3, 1)

5.

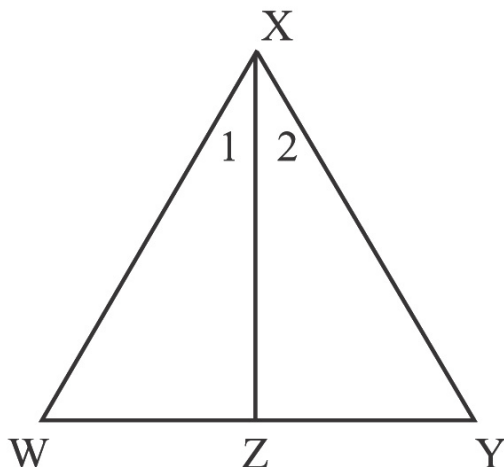
In the figure below, $\overline{GE} \cong \overline{RT}$, $\overline{YO} \cong \overline{YM}$, and $\angle E$ and $\angle T$ are right angles. $\triangle GEM \cong \triangle RTO$ by:



- A. SAS
- B. AAS
- C. SSA
- D. HL

6.

Which of the following does not give enough information to prove that $\triangle WXZ \cong \triangle YXZ$?



- A. \overline{XZ} bisects $\angle WXY$ and $\angle W \cong \angle Y$
- B. Z is the midpoint of \overline{WY} and $\angle 1 \cong \angle 2$
- C. $\overline{XZ} \perp \overline{WY}$ and $\overline{WX} \cong \overline{YX}$
- D. \overline{XZ} the perpendicular bisector of \overline{WY}

7.

If $\triangle ABC \cong \triangle TUV$, which of the following statements is NOT true?

- A. $\angle C$ is congruent to $\angle V$.
- B. Segment \overline{BC} is congruent to segment \overline{UV}
- C. $\angle ABC$ is congruent to $\angle UTV$
- D. Segment \overline{AB} is congruent to segment \overline{TU}

8.

If $\triangle PQR \cong \triangle ABC$, find the value of x and y given the following information

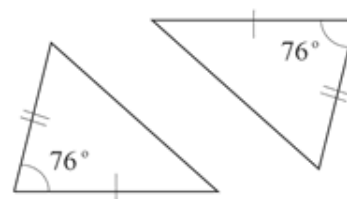
$$m\angle R = 3x + 50; m\angle C = 27x - 22,$$

$$QR = 6y - 2 \text{ and } BC = x + y$$

- A. $x = 1$ and $y = 3$
- B. $x = 3$ and $y = 1$
- C. $x = 3$ and y cannot be determined
- D. neither value can be determined based upon the given information

9.

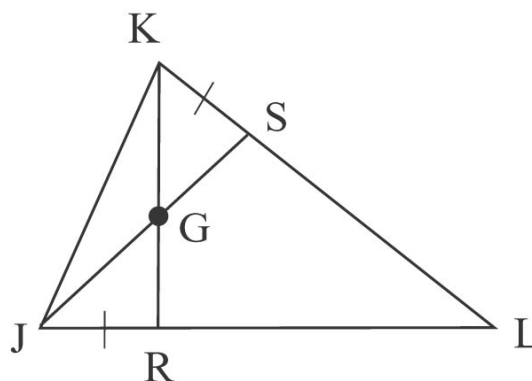
Which congruence best expresses the relationship showing that the triangles below are congruent?



- A. SSS
- B. SSA
- C. SAS
- D. ASA

10.

What information is needed to prove $\triangle JGR \cong \triangle KGS$ under AAS congruence?



- A. No additional information is needed.
- B. That \overline{KR} and \overline{JS} bisect each other.
- C. That \overline{JS} and \overline{KR} are medians.
- D. That \overline{JS} and \overline{KR} are altitudes.

11.

$$\begin{aligned}\triangle ABC &\cong \triangle PQR \\ m\angle QPR &= 8X + 4 \\ m\angle CAB &= 5X + 16 \\ \text{and } m\angle RQP &= 10X + 2\end{aligned}$$

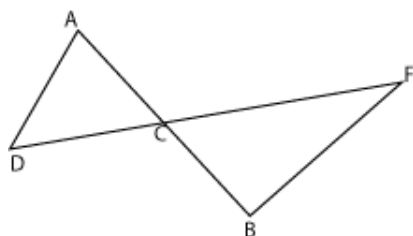
Find $m\angle PRQ$

- A. 102°
- B. 36°
- C. 42°
- D. Not enough information to find the measure

12.

Given: C is the midpoint of \overline{AB} ;
C is the midpoint of \overline{DF} .

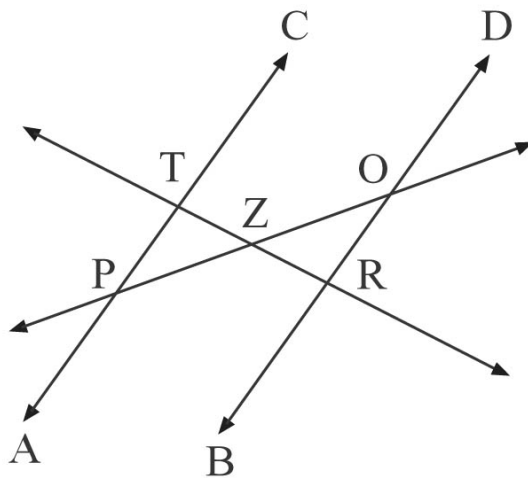
Prove $\overline{AD} \parallel \overline{BF}$



Statements	Reasons
1. C is the midpoint of \overline{AB}	1. Given
2. $\overline{AC} \cong \overline{BC}$	2. _____
3. C is the midpoint of \overline{DF}	3. Given
4. $\overline{DC} \cong \overline{CF}$	4. _____
5. $\angle DCA \cong \angle FCB$	5. _____
6. $\triangle DCA \cong \triangle FCB$	6. _____
7. $\angle A \cong \angle B$	7. _____
8. $\overline{AD} \parallel \overline{BF}$	8. _____

13.

IF \overline{AC} is parallel to \overline{BD} and point Z is the midpoint of both \overline{TR} and \overline{PO} explain whether $\triangle OZR$ is congruent to $\triangle PZT$ and which congruence relationship(s) you use to justify your answer



14.

Complete the following proof.

If \overline{AC} and \overline{BD} bisect each other at point M , then $\triangle AMB \cong \triangle CMD$.

A. Draw a diagram to represent the situation.

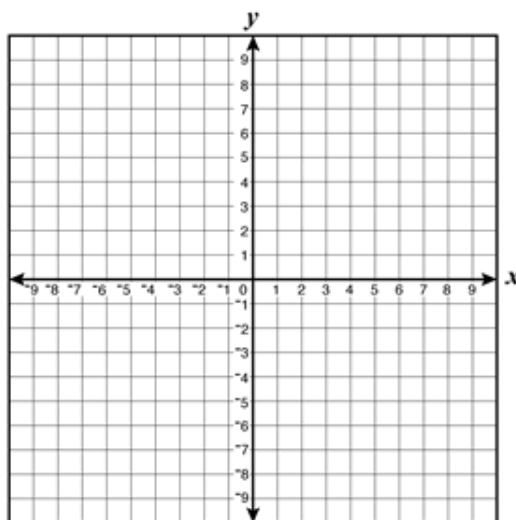
B. Fill in the table to complete the proof.

\overline{AC} and \overline{BD} bisect each other at M	Given
$\angle AMB \cong \angle CMD$	Vertical angle theorem
$\triangle AMB \cong \triangle CMD$	SAS postulate

15.

A triangle with vertices $A(2, 3)$, $B(8, 5)$ and $C(4, 9)$ is rotated 90° clockwise about the origin to form Triangle $A'B'C'$.

A. In the graph below, graph Triangle ABC and $A'B'C'$.

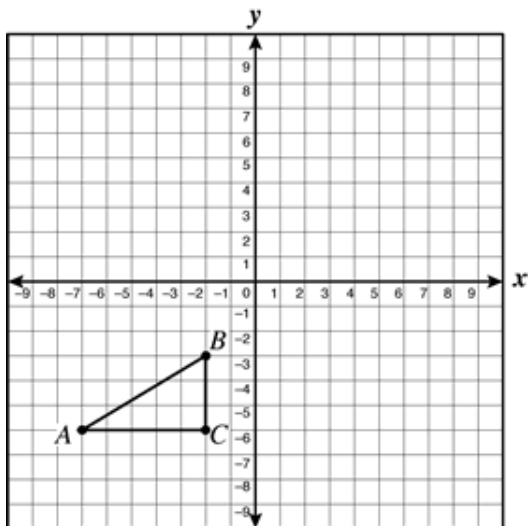


B. Explain why the two triangles are congruent.

C. What is the perimeter of each triangle?
Round your answer to the nearest hundredth.

16.

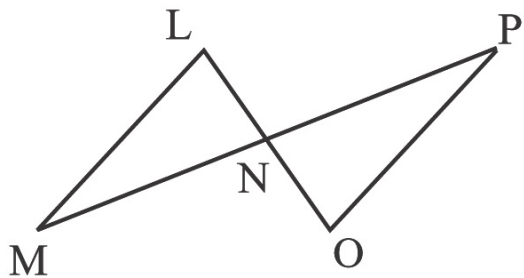
The grid below shows Triangle ABC .



If Triangle ABC is reflected across the y -axis to form Triangle $A'B'C'$, what is the change in slope from \overline{AB} to $\overline{A'B'}$?

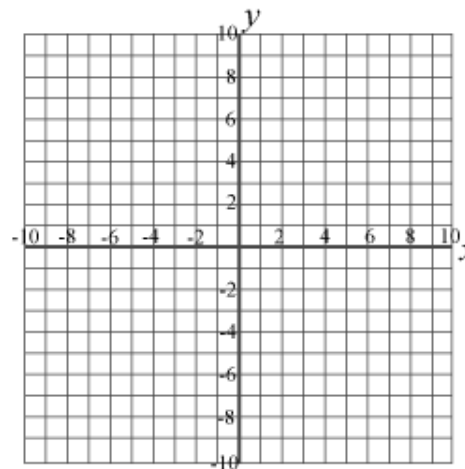
17.

A student reasons that if $\angle L \cong \angle O$ and $\angle M \cong \angle P$, then $\triangle LNM$ must be congruent to $\triangle ONP$. Defend his reasoning or show the error of his conclusion.



18.

A triangle has coordinates at $(-2, 0)$, $(2, -2)$ and $(1, 2)$. Plot this triangle on a coordinate grid. If the x and y -coordinates are interchanged, will the new triangle be congruent? Justify your answer.



Answer Key

#	Item ID	Key	TEKS	Stimulus
1	M0G00163RX	C	G.3C	-
2	M0G00052RX	A	G.10B	-
3	M0G00056RX	A	G.10B	-
4	M0G3058023	D	G.7A	-
5	MG1060819RX	B	G.10B	-
6	MG1060837RX	B	G.3B	-
7	MG1085426RX	C	G.2B	-
8	MG1085428RX	B	G.2B	-
9	MG1085432RX	C	G.10B	-
10	MG1085436RX	D	G.10B	-
11	MG1085438RX	A	G.10B	-
12	MG1085430RX	2. def. of midpoint; 4. def. of midpoint, 5. vertical angles are congruent; 6. SAS; 7. CPCTC; 8. If alternate interior angles are congruent, the lines are parallel	G.2B	-
13	M0G00054RX	See attached Rubric or Checklist	G.10B	-
14	M0G00172RX	See attached Rubric or Checklist	G.3C	-
15	M0G3056336	See attached Rubric or Checklist	G.10A	-
16	M0G3069473	See attached Rubric or Checklist	G.10A	-
17	MG1060823RX	See attached Rubric or Checklist	G.10B	-
18	MG1085424RX	See attached Rubric or Checklist	G.3B	-

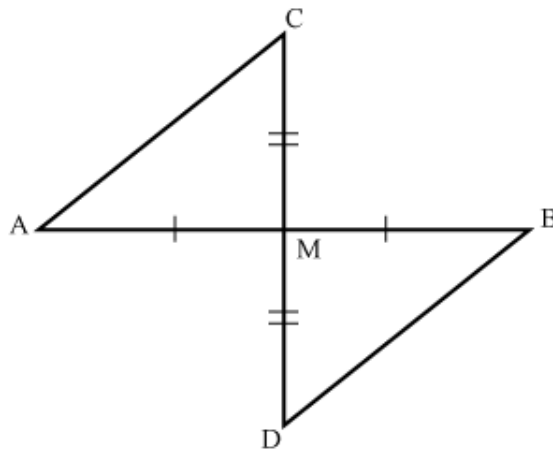
Checklist List

13)

$\overleftrightarrow{AC} \parallel \overleftrightarrow{BD}$, then the angles
 formed at point Z are 2 pair
 of vertical angles and
 $\angle TZP \cong \angle OZR$. Since it is
 given that point Z is the
 midpoint of segments TR
 and PO then $TZ = ZR$ and
 $PZ = ZO$. This allows proof
 that triangle OZR is congruent
 to triangle PZT by
 Side-Angle-Side congruency.

14)

A.

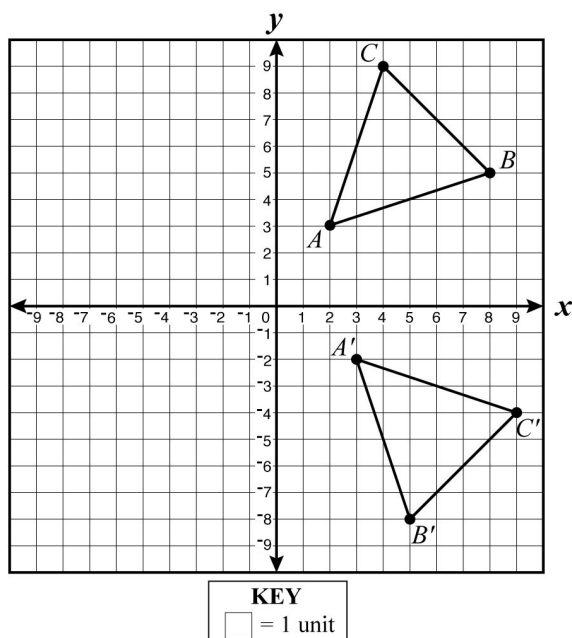


B. $AM = MB$
 $CM = MD$

Definition of
 Midpoint

15)

A.



Triangle A'B'C' is drawn with vertices X(3, -2) Y(5, -8) and Z (9, -4)B. The two triangles are congruent because a rotation does not change the lengths of the sides nor the size of the angles, OR by distance formula. Both agree in all three corresponding sides.

C. $4\sqrt{10} + 4\sqrt{2}$ or approx. 18.31 units

16)

From slope of $\frac{3}{5}$ to a slope of $\frac{-3}{5}$ in $\overline{A'B'}$

17)

The student is wrong. The vertical angles at N are also congruent, but AAA will only make the triangles similar, not congruent.

18)

Note: Justification answers may vary. Students could use distance formula to prove sides are congruent; therefore, the triangles are congruent by SSS. Or, students may use the concept of rotation to justify answers.

3	The response shows full understanding of the essential mathematics applicable to the task and a sound approach toward solution that includes logical reasoning and appropriate conclusions. Computation and procedures used are generally accurate, but the response may contain minor computational or procedural flaws that do not detract from evidence of full understanding.
2	The response shows a satisfactory understanding of the essential mathematics applicable to the task, but reasoning may not be completely clear, and there may be minor flaws in computation and/or use of procedures as a result of carelessness or non-essential misunderstandings. The flaws do not detract from evidence of satisfactory understanding. A score of 2 may also be earned if the response is partially correct but some aspect of the task is omitted.
1	The response indicates limited understanding of the essential mathematics applicable to the task. While an effort is made to address the task, omissions and/or errors related to insufficient mathematical knowledge or incorrect application of skills or procedures bring into question that student's ability to deal successfully with tasks of this type.
0	The response indicates no understanding of the essential mathematics applicable to the task, or there is no response

Rubric List**13)**

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14)

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